

Date: July 5, 1990
 To: X3T9.2 Members
 From: John Lohmeyer, X3T9.2 Chairman
 Subject: High-Density Interconnection Working Group Meeting

I chaired a working group meeting June 19, 1990 from 10:00 a.m. until 12:00 noon to investigate high-density interconnection issues for SCSI-2. Almost all of the meeting was consumed in presentations from the following people:

Company	Name/phone	Foils	H/W
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NCR	John Lohmeyer (316) 636-8703	no	yes
Hewlett Packard	Ed Silva (916) 785-4204	yes	yes
Icontec	Alan Haig (408) 945-7766	yes	yes
Context Elect./Mold-Con	Roger Brickley Bob Krzynowek (413) 736-0371	yes	yes
CMS	Wayne Douglas (508) 580-0111	yes	?
Connective Technologies	Fred Hengelhaupt (802) 257-5242	yes	yes
Black Box Corp.	Bob Stevens (412) 746-6829	(Observe only)	
Amphenol	Bill Sopchak (607) 786-4370	no	yes
AMP	Bob Whiteman (717) 780-7481	yes	yes
Honda Connector	David McFadden (708) 913-9566	yes	yes
Fujitsu	Joel Urban (408) 562-1722	yes	yes
3M	Bob Herron (512) 984-6807	yes	yes
Hirose Electric	Oscar Kornblum (805) 522-7958	yes	?
JAE	David Shaff (714) 753-2600	yes	yes

I have attached copies of the presentations which were made available to me.

Some issues that were identified are:

1. NCR has experienced difficulties in finding cost-effective solutions for mixing high-density shielded connectors on cabinets with nonshielded low-density connectors inside cabinets. They are especially concerned about finding good solutions for the upcoming P cable.
2. HP has experienced bent pin problems with the high-density connector when mounted horizontally with cables long enough to cause the connector to sag (droop). They are considering using jackscrews instead of the clips shown in the SCSI-2 figures. The cable droop does not cause loss of electrical continuity, but can deform the pins.
3. Several cable assembly vendors pointed out that all of their customers for SCSI cables have unique requirements. There is no such thing as "the" SCSI cable.
4. One cable assembly vendor strongly recommended against using 2-56 jackscrews presumably because they are too weak and break when over tightened. (Later in the week, I learned that the HIPPI standard will call out 2-56 jackscrews with a minimum torque specification that can be met with stainless steel screws. The 4-40 screws have interference problems.)
5. Some customers are frustrated by slow delivery times on the high-density connectors.
6. Bob Whiteman (AMP) showed a prototype 68-position daisy-chain high-density connector which uses 0.025 inch centerline ribbon cable.

No follow-up meeting is planned, however the HP issue concerning the retention mechanism will be included on the August X3T9.2 agenda.

Attachments:

HIGH-DENSITY CONNECTOR ISSUES

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HIGH-DENSITY CONNECTOR ISSUES

- Problems encountered
 - Cable sag
 - Standard testing
 - Connection break testing
 - Failures
- Availability
- Retaining clips
- Jackscrews
- Recommendation

PROBLEMS ENCOUNTERED

- Cable Sag
- Availability
- Standard not unanimously followed

CABLE SAG

- **Sagging connector lacks "look of quality"**

Does not look like a ten year product

- **Several questions from Internal customers**

- **Will end-users have same reliability questions?**

STANDARD TESTS

- **Environmental**

 - Temperature and humidity

- **RFI / EMI**

- **Shake and Vibration**

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CONNECTION BREAK TEST

- **Passed electrical continuity**

Data integrity maintained

- **Mechanical failure**

Pins lost alignment during life testing

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FAILURES

- Push through
- Ripped shield
- Bent pins

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AVAILABILITY

- **Manufacturers are having difficulties designing molded housing**

Common complaint: inconsistent dimensions between connector manufacturers

- **Of 5 cable houses evaluated to date, only 1 latch design worked**

- **Most cable manufacturers have experience with jackscrews**

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RETAINING CLIPS

- Excessive cable sag
- Difficult to manufacture
- Not unanimously recognized as part of Standard

Has committee thoroughly evaluated the latches?

JACKSCREWS

- **Holds the assembly rigid, eliminating sag**
- **Easily manufactured**
- **Modern jackscrews are easy to use**

Peripheral connecting is not a frequent event

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**RECOMMENDATION: committee approve
jackscrews as an alternate to latches**

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ICONTEC

VARIABLES TO SCSI II SOLUTIONS

Typical Mech. Variables for General Computer Cable Assemblies

- Conductor O.D.
- Wire Gage
- O.D. of Cable

Additional Variables for SCSI-2

Type of Insulation:

- Polypropylene
- Polyethylene
- Polyolefin
- Solid or Foam

Type of Termination Equipment

- Manual
- Semi-Automatic
- Laminating (if necessary for termination)

External or Internal

Internal - need lamination

- Strain relief for bulk head connector
- Organize wires on .050 center for standard IDC .100 grid connectors.

External

- Post mold effect on insulation
- Metal back shell - too much compression of conductors at can entrance.

ICONTEC

ICONTEC SCSI II Cabling Solutions

EXTERNAL SCSI II

Cable Termination: Insulation Types - 28 & 30 AWG
PVC
Polypropylene
Polyethylene
Polyolefin
Cellular HDPE

High Volume Capacity Connector Termination: AMP, Inc
Honda
Fujitsu

High Volume Capacity:
Post Molded Version over
Metal Can Shielding System: AMP, Inc.
Honda

Benefits: Production of finished assemblies ranging
from 75-80 ohms thru 95-100 ohms single end
mode while utilizing any one of three major
connector manufactures.

INTERNAL SCSI II

Flat Ribbon Cable - IDC

Laminated "Round to Flat" Twisted Pair: 28 & 30 AWG
PVC
Polypropylene
Polyethylene
Polyolefin

Daisy Chain Capabilities - 28 & 30 AWG with above insulation
systems.

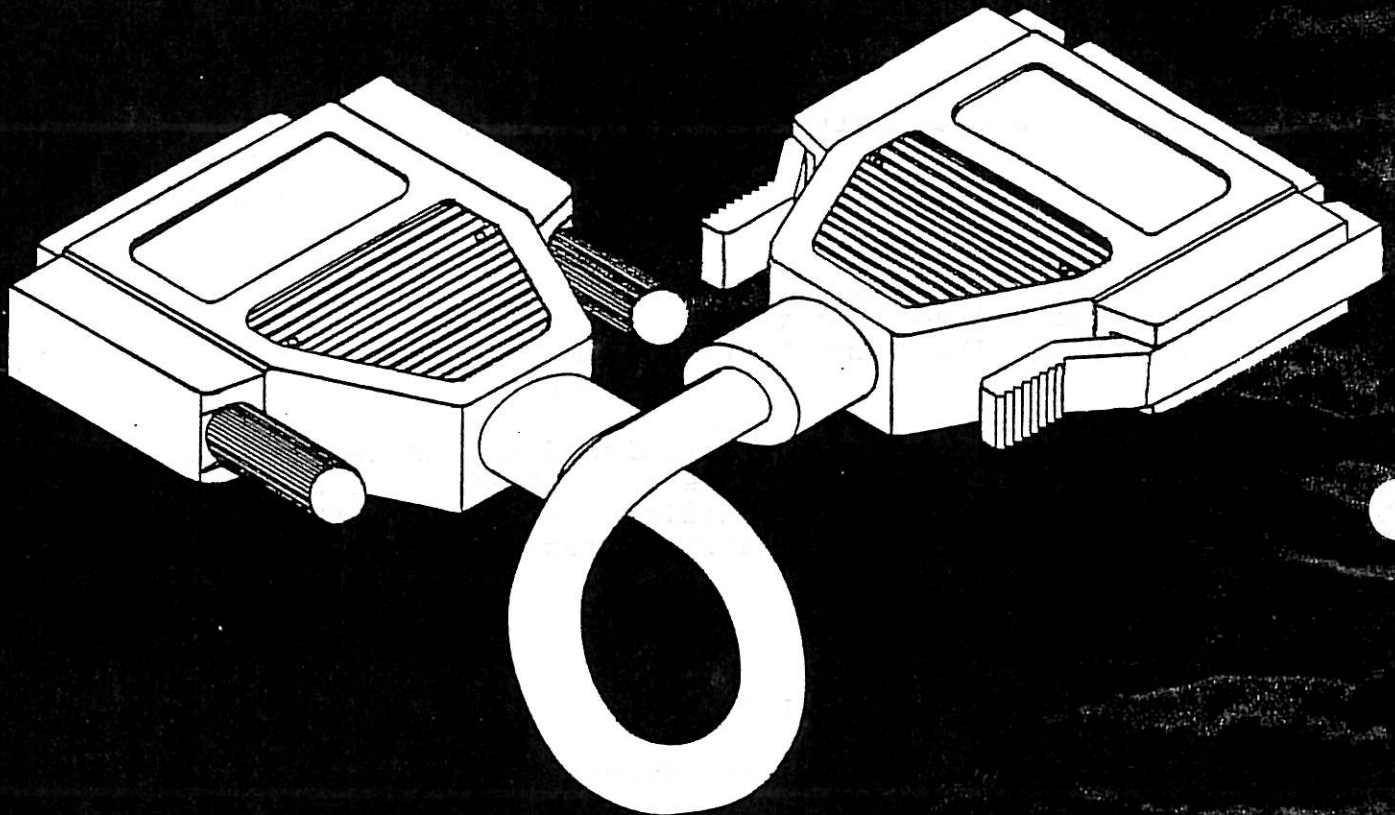
Benefits: Allows High Density SCSI II I/O to standard
50 position IDC Sockets used on drive and
controller cards.

Features: a) Improved impedance values to minimize delta
with external cable.
b) Superior airflow over Flat Ribbon
c) Easier Routing
d) Daisy Chain Capabilities
e) Integration of Terminator requirements at the
internal cable.

SCSI 2

CONTEX ELECTRONICS

Introduces The Ultra-Slim .050 Ctr. 50 Position
Molded Cable Assembly



- Available with squeeze to release latching mechanism or thumbscrews (4-40 or 2-56).
- Meets SCSI and IPI standards.
- Offered in fork and blade or micro-ribbon style.
- ESD protection through plastic latches and molded thumbscrews.
- A full line of Terminators available.
- 100 percent EMI & RFI shielded.
- Custom logos and choice of color.

FOR MORE INFORMATION CALL

CONTEX/MOLDCON.

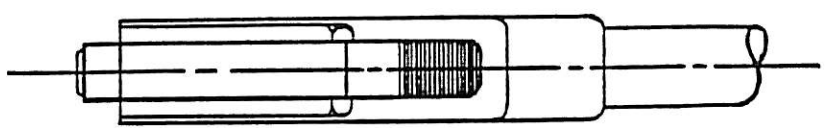
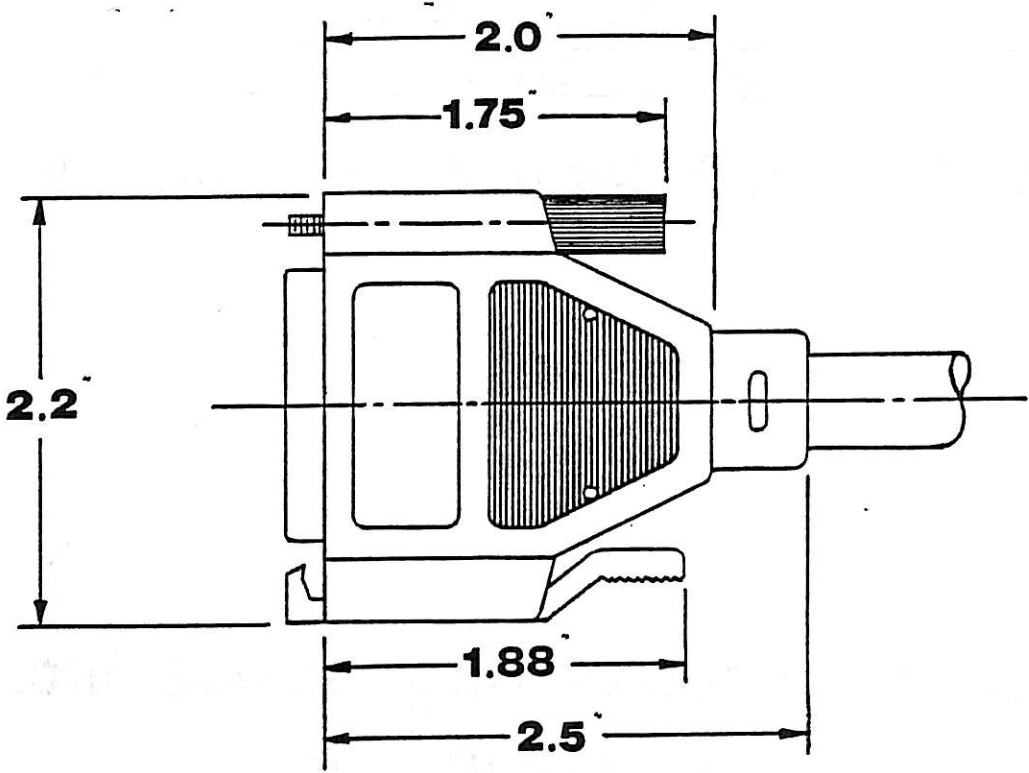
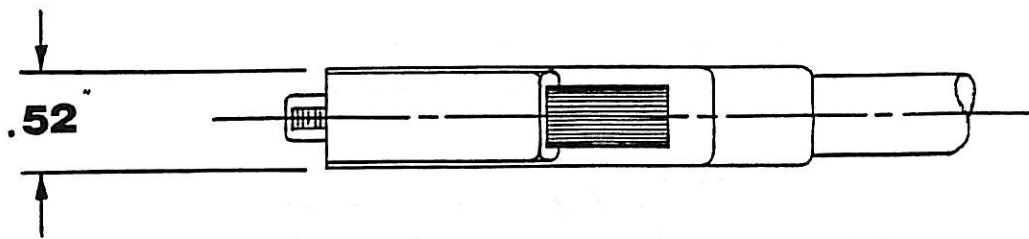
TEL.(413)736-0371

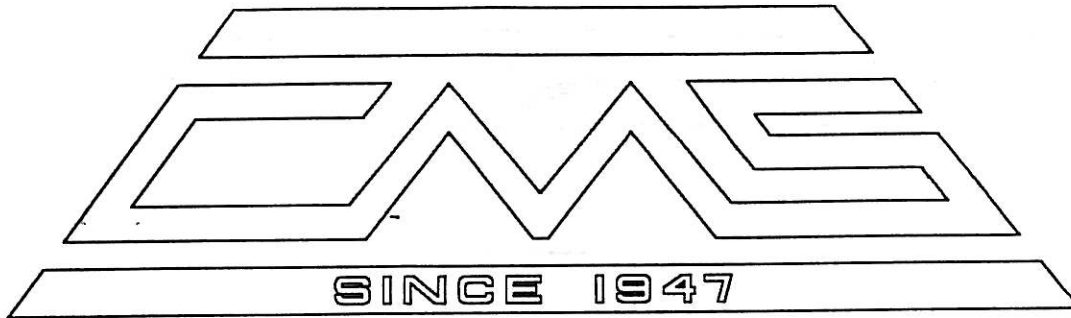
FAX.(413)736-9716

CONTEX/TRI-TEC.

TEL.(213)327-3960

FAX.(213)515-1691





the Molded-On® Connector Company

**Component Manufacturing Service, Inc.
One Component Park
West Bridgewater, Massachusetts 02379**

- Founded in 1947, extensive experience in providing full service interconnection solutions.
- Principal business of custom Molded-On® products and cable assemblies.
- Technical expertise/experience to develop proper shielding or ground techniques and solutions for custom needs.
- 100 % of all cable assemblies are tested at final inspection to meet or exceed customer specifications.
- Total responsibility of in-house design and tooling capability.
- Worldwide supplier from multiple manufacturing facilities in the United States and Europe.



Three Critical Operations

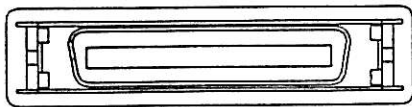
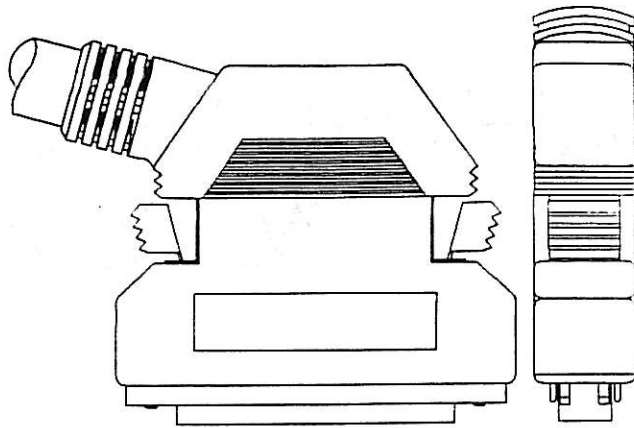
- Cable selection and preparation
- Connector selection and assembly
- Cable assembly fabrication methods



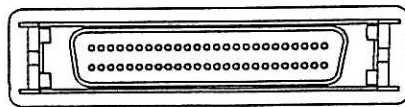
Shielded Cable Assembly Methods

- Lead Foil
- PCB's
- Copper Foil
- Plated Plastic
- Braid Straps
- Zicad Can
- Silver Bullet

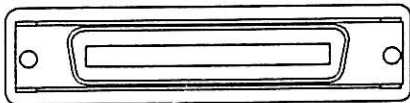
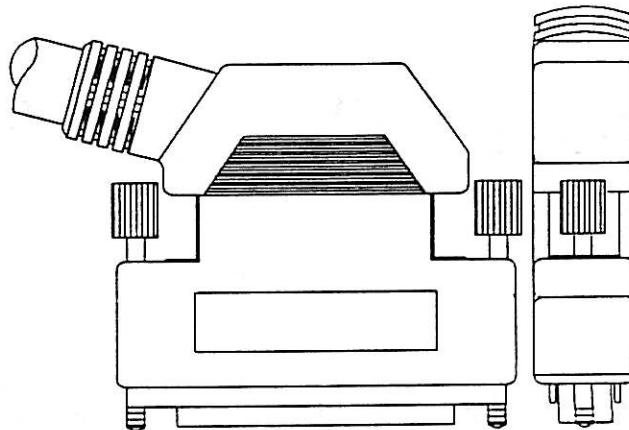




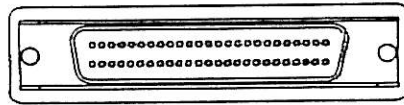
MALE .050 CENTERS
RIBBON CONTACT CONNECTOR



.050 CENTERS PIN &
SOCKET CONNECTOR

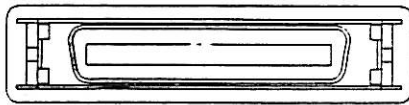
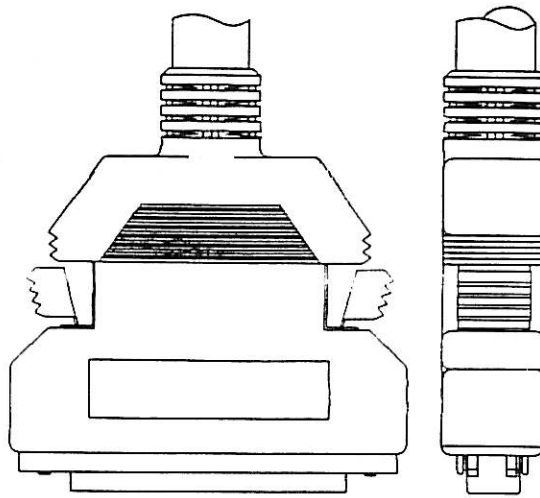


MALE .050 CENTERS
RIBBON CONTACT CONNECTOR

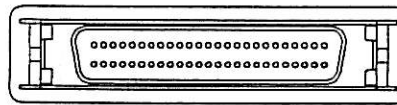


.050 CENTERS PIN &
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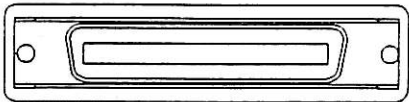
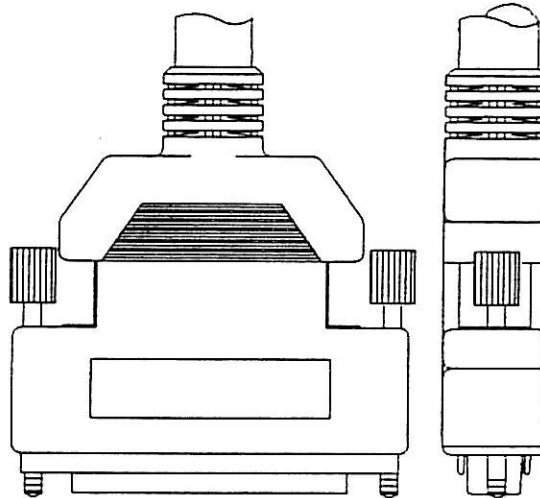




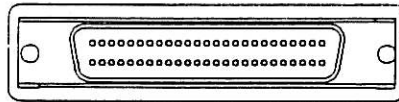
MALE .050 CENTERS
RIBBON CONTACT CONNECTOR



.050 CENTERS PIN &
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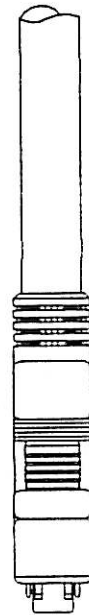
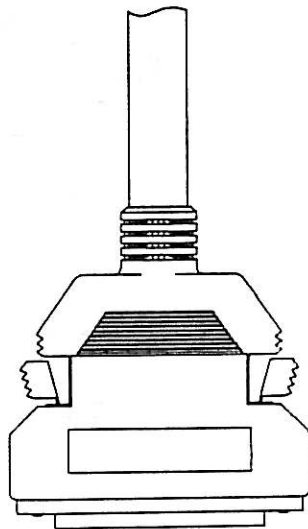
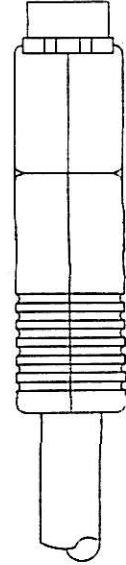
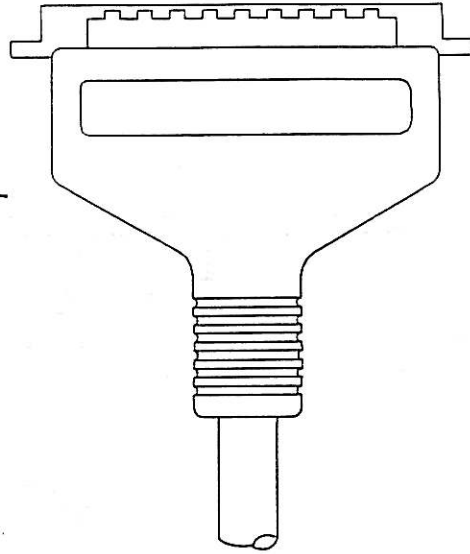
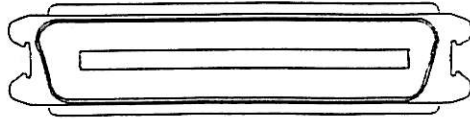


MALE .050 CENTERS
RIBBON CONTACT CONNECTOR



.050 CENTERS PIN &
SOCKET CONNECTOR





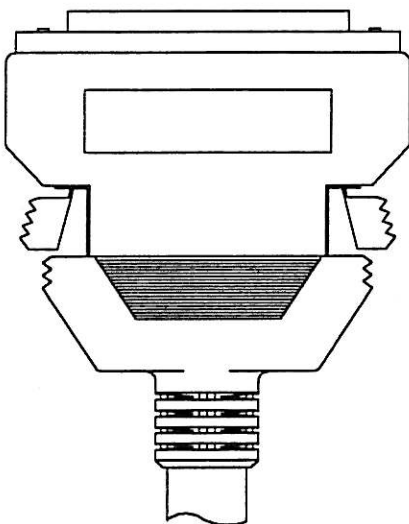
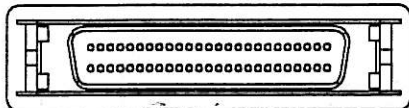
CMS Molded-On® Advantages

- Color matching to system
- Custom logo or part number molded in
- Date code with traceability
- Durable and tamper proof
- Attractive compact designs
- Cost effective shielding methods



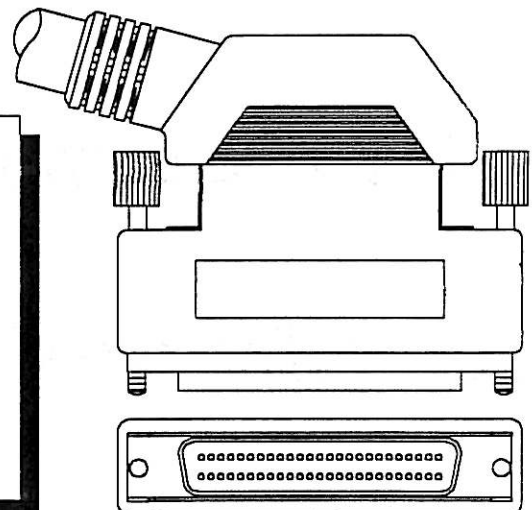


AND
SCSI II
THE
RIGHT CONNECTION



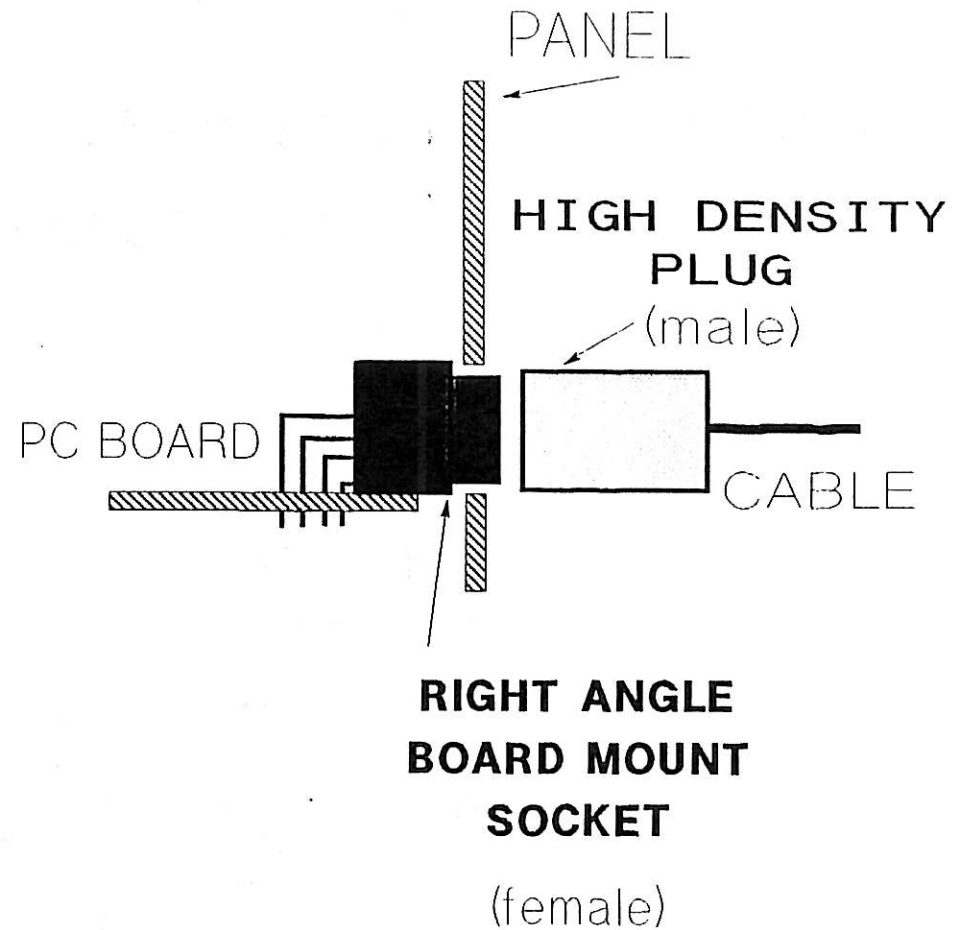
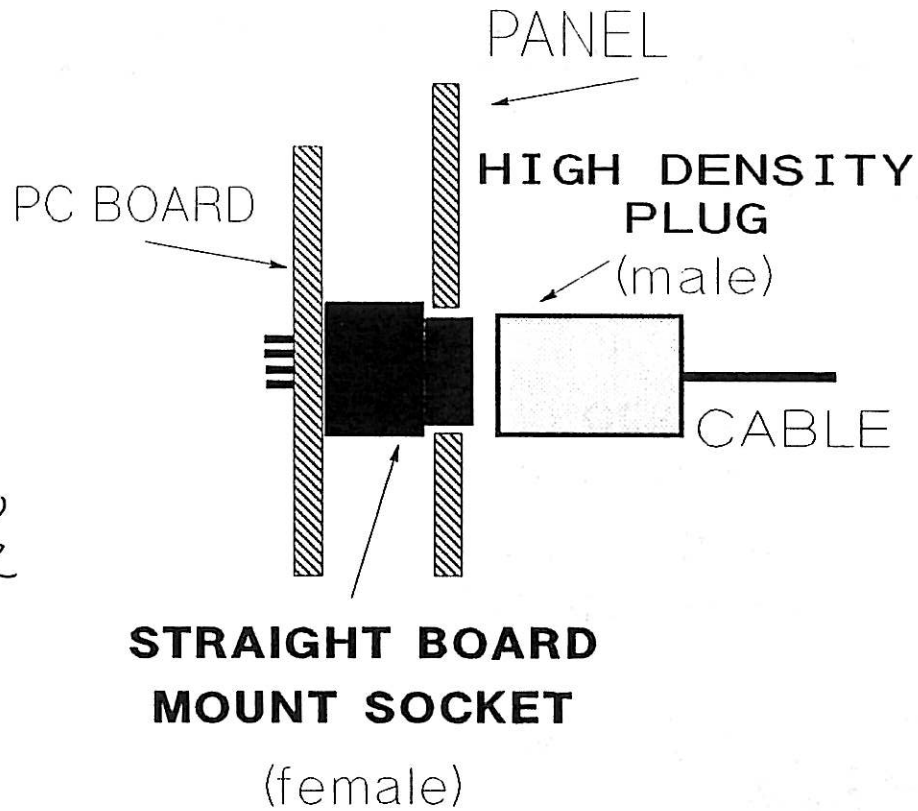
- Molded-On ® cable assembly
- Logo or part number molded into connector
- Squeeze-to-release spring latch or jackscrew hardware
- Straight out or angular exit
- Streamlined flex strain relief

- Compliance with SCSI II, EIA RS-232, enhanced IPI, and HPPI standards
- High-density D type interface featuring .050 [1.27] contact centerline spacing
- Attractive, durable finish molding with color matching to your system



COMPONENT MANUFACTURING SERVICE, INC.
ONE COMPONENT PARK
WEST BRIDGEWATER, MASSACHUSETTS 02379
508-580-0111

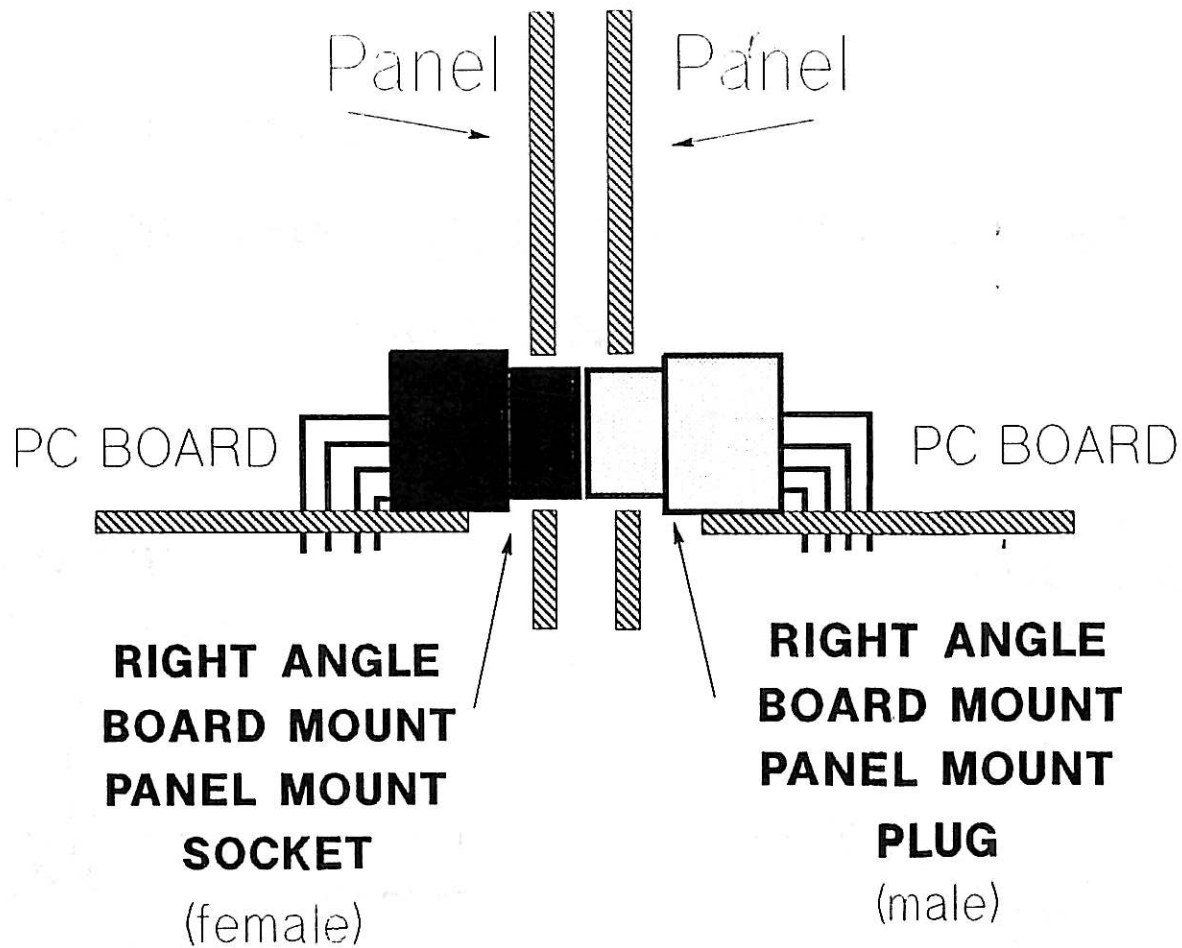
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APPLICATION #1

High Density System Interconnections

3M INTERCONNECT SYSTEMS



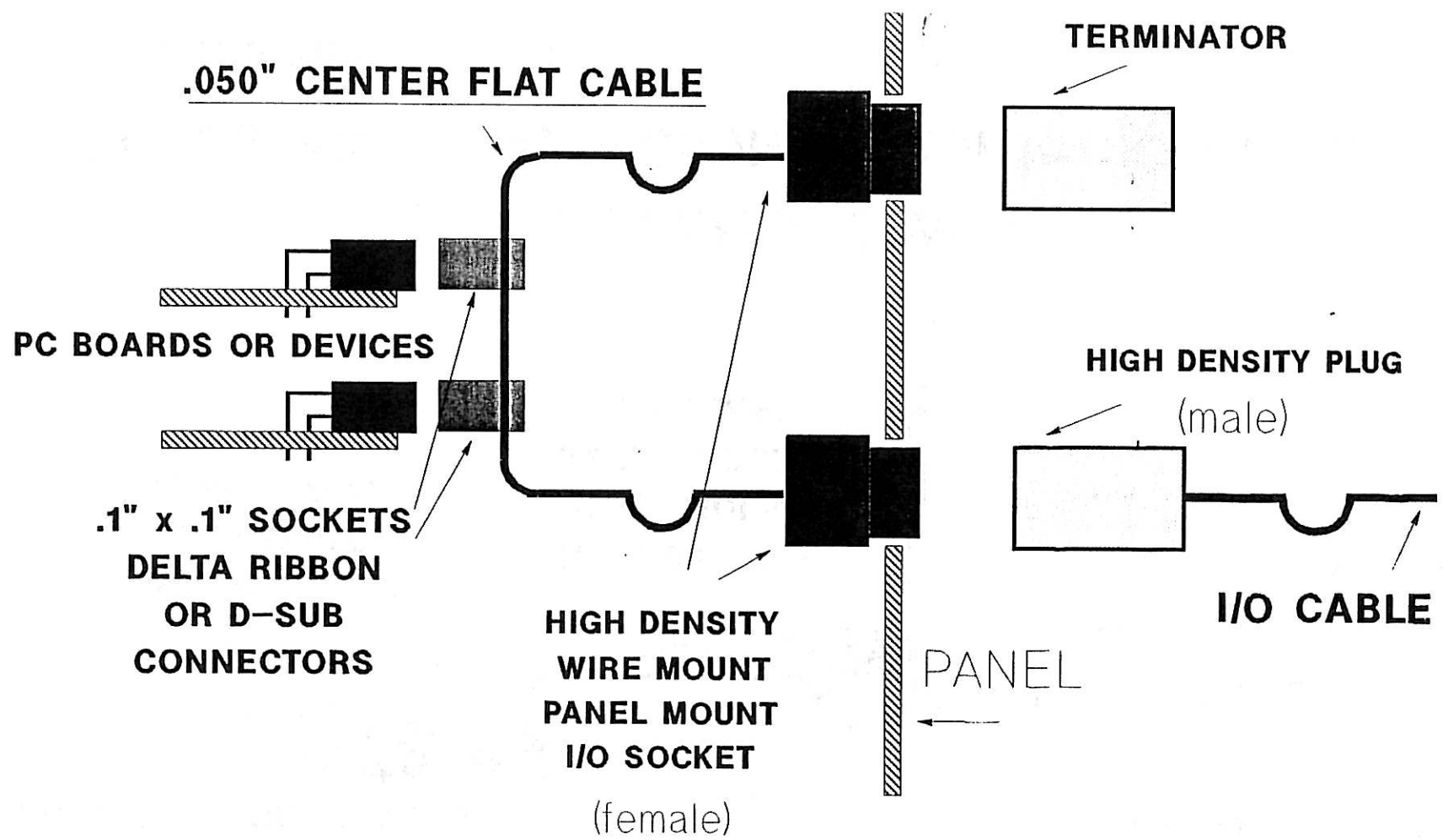
202

APPLICATION #2

High Density Board-Panel-Board System

3M INTERCONNECT SYSTEMS

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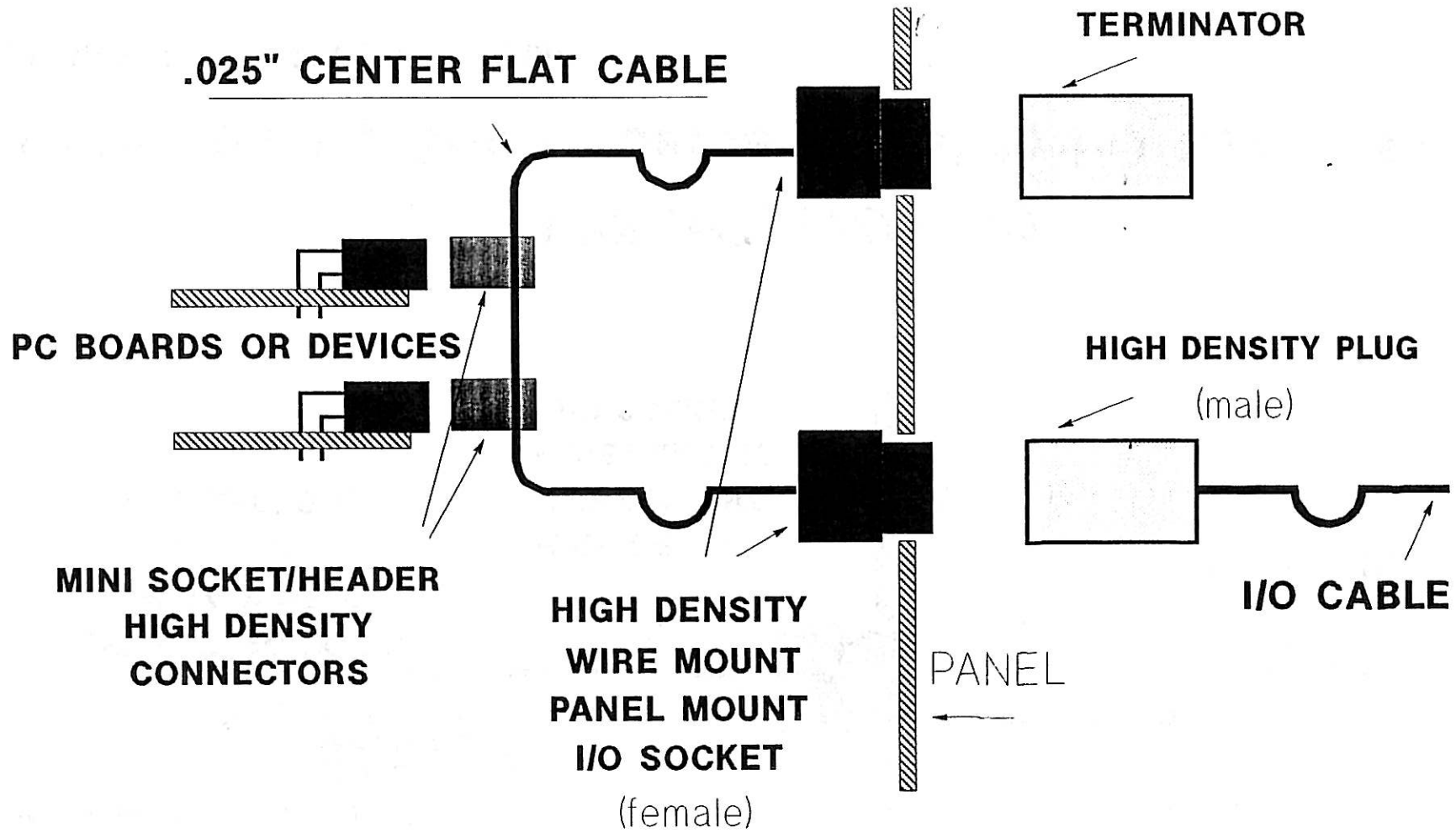


APPLICATION #3

High Density Board-Cable-Panel to I/O Cable System

3M INTERCONNECT SYSTEMS

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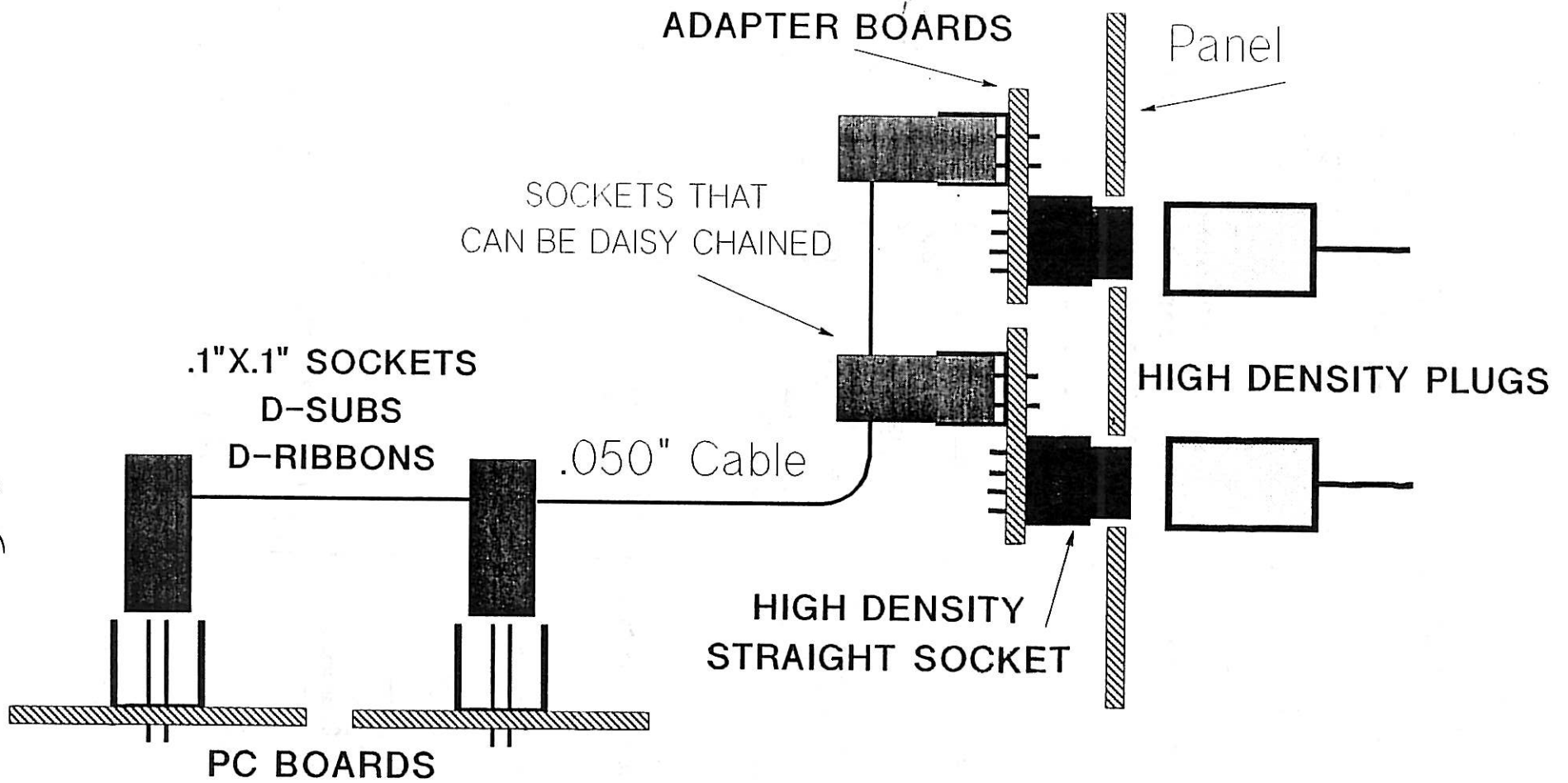


APPLICATION #4

High Density Board-Cable-Panel to I/O Cable System

3M INTERCONNECT SYSTEMS

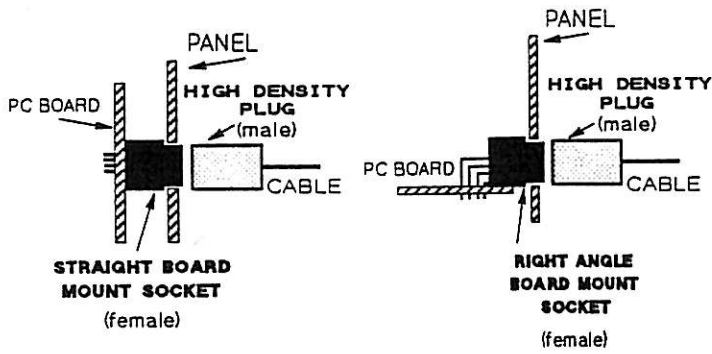
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APPLICATION #5

Daisy chained board and I/O connectors

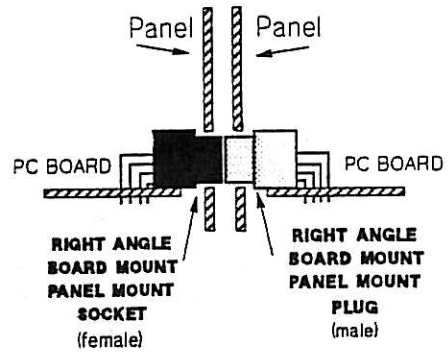
3M INTERCONNECT SYSTEMS



APPLICATION #1

High Density System Interconnections

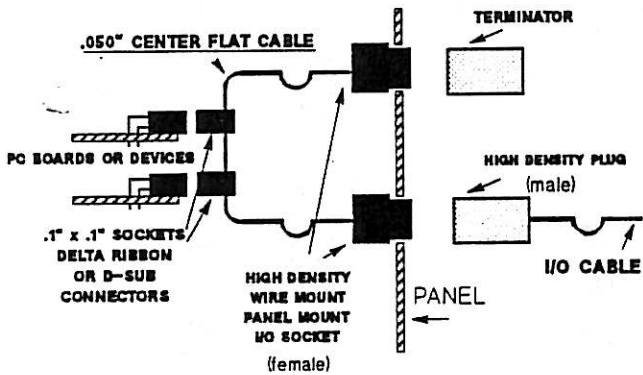
3M INTERCONNECT SYSTEMS



APPLICATION #2

High Density Board-Panel-Board System

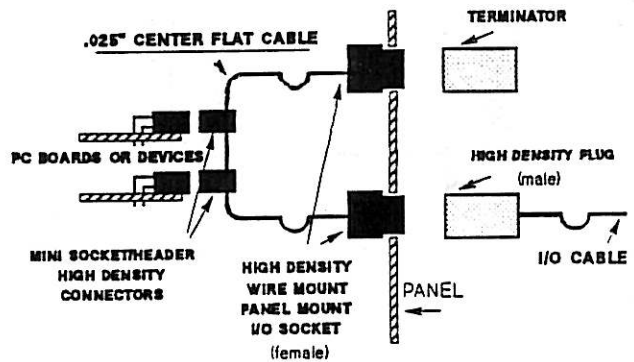
3M INTERCONNECT SYSTEMS



APPLICATION #3

High Density Board-Cable-Panel to I/O Cable System

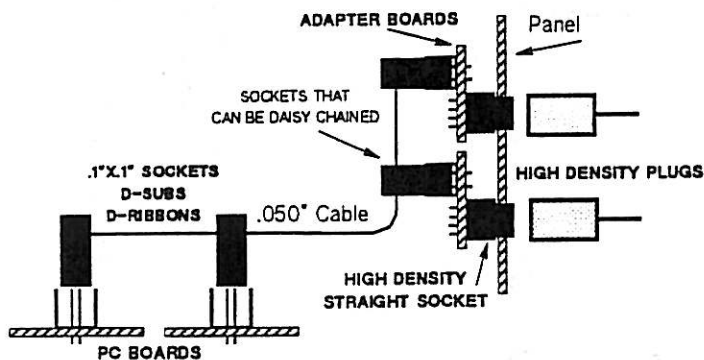
3M INTERCONNECT SYSTEMS



APPLICATION #4

High Density Board-Cable-Panel to I/O Cable System

3M INTERCONNECT SYSTEMS



APPLICATION #5

Daisy chained board and I/O connectors

3M INTERCONNECT SYSTEMS

**3M
MINI DELTA RIBBON
APPLICATIONS**